testo 521 · testo 526

Instruction Manual

en

Foreword / Copyright

Foreword

Dear Testo Customer,

We are delighted that you have chosen a product from Testo. We hope that the product will give you a long period of satisfaction and will aid you in your work.

If problems should occur which you cannot rectify yourself, please consult our service department or your dealer. We will endeavour to provide fast and competent assistance to avoid lengthy down times.

Copyright

This documentation is subject to the copyright of **testo** AG. Reproduction and use contrary to the legitimate interests of Testo AG are prohibited without the prior, written consent of the company.

We reserve the right to modify technical details from the descriptions, specifications and illustrations contained in this documentation.

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Germany

General notes

This documentation contains important information about the features and use of the product. Please read this document through carefully and familiarise yourself with the operation of the product before putting it to use. Keep this documentation to hand so that you can refer to it when necessary.

Pictograms

This product could be dangerous if operated incorrectly. Information that requires particular attention is identified in these Operating Instructions by pictograms:

Warnings are identified by means of a warning triangle. The relevant **signal word!** indicates the degree of risk:

Signal word

Warning! means: Serious physical injury could occur if you do not take the precautionary measures indicated.

Caution! means: Slight physical injury or material damage could occur if you do not take the precautionary measures indicated.

Pay particular attention to warnings and take the precautionary measures indicated in order to avoid danger.

! Notes on special cases and peculiarities in the handling of your unit are indicated by an exclamation mark.

521
526

Indicates with which instrument variant a menu can be executed.

Content

The content of this documentation relates to the **German** version of the instrument.

Standards / Tests

CE As declared in the certificate of conformity, this product fulfils the guidelines of 89/336/EEC.

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1. Fundamental safety instructions

Avoid electrical hazards:

- Never make measurements with the instrument and its probes on or near live components unless the instrument is expressly approved for current/voltage measurements!

Protect the instrument:

- Never store the instrument together with solvents (e.g. acetone).

Product safety/preserving warranty claims:

- Operate the instrument only within the parameters specified in the technical data.
- Handle the instrument properly and according to its intended purpose.
- Never apply force!
- Temperatures given on probes/sensors relate only to the measuring range of the sensors. Do not expose handles and feeders to any temperatures in excess of 70 °C unless they are expressly permitted for higher temperatures.
- Open the instrument only when this is expressly described in the Instruction Manual for maintenance purposes.
- Carry out only the maintenance and repair work that is described in the Instruction Manual. Follow the prescribed steps exactly. For safety reasons, use only original spare parts from Testo.
- Any further or additional work must only be carried out by authorised personnel. Testo will otherwise refuse to accept responsibility for the proper functioning of the instrument after repair and for the validity of certifications.

Ensure correct disposal:

- Dispose of defective rechargeable batteries and spent batteries at the provided collection points.
- Send the instrument directly to us at the end of its life cycle. We will ensure that it is disposed of in an environmentally friendly manner.

2. Intended purpose

Employ the instruments for the following applications only:

The **testo 521** and **testo 526** instruments are handheld pressure-measuring instruments that were developed specifically for use in air conditioning/ventilation equipment, thermal engineering, automotive engineering and industrial plant engineering. The main areas of use and measuring applications are:

testo 521

Air conditioning/ventilation, clean rooms and OPs:
Pressure ranges 0 to 100 hPa/0...2,5hPa, Pitot tube measurement, volume flow calculation, pressure drop on filters, fans, ...

testo 526

Industrial pressure measurement:
Pressure ranges 0 to 2000 hPa, pressure in compressed air systems, leaks in pipes & lines, pressure drop, vacuum

Both instruments offer the following features:

- Measurement location management
- Data management via **testo ComSoft** software (from Version 3)
- "on-site" printout of the measured results via the **testo printer**
- Temperature measurement
- Wide range of probes and sensors can be connected so that one instrument covers as many measuring tasks as possible

Location conditions

Changes in the location and temperature of the instrument and pressure probes have an effect on the measurement results. Bring the instrument and probes into a stable position before any measurement.
Do not change this position during measurement.
Do not subject the housing to mechanical strains during measurement.

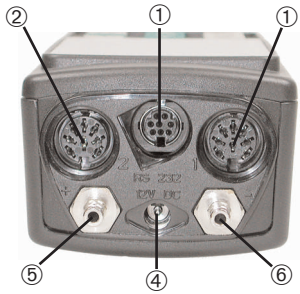
Media compatibility

testo 521/526:
Permitted medium: air and non-aggressive gases

External low pressure probes 0638 1347, 0638 1447, 0638 1547, 0638 1647, 0638 1747: Permitted medium: air and non-aggressive gases

External high-pressure probes 0638 1741, 0638 1841, 0638 1941, 0638 2041, 0638 2141: Permitted medium: refrigerant, oil, water, air and non-corrosive gases

3. Product description



3.1 Power supply

Power is supplied to the **testo 521/526** optionally via:

- 9 V monobloc battery, type: IEC 6LR61 (included)
- 9 V monobloc rechargeable battery, type: NiMH IEC 6F22 (0515 0025)
- Mains connection and battery charging via mains unit 0554 0088, see also page 38 6.6.3 Battery type)

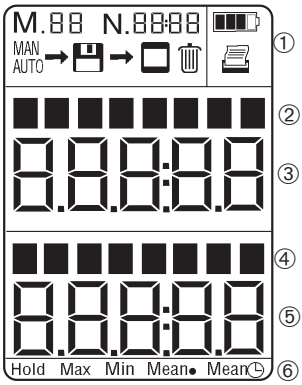
3.2 Controls

Keyboard

① Print
② Select reading 1 (top line), select menu item
③ Switch on/off
④ Save data
⑤ Open menu level, confirm selection, execute function
⑥ Zero pressure probes
⑦ Cancel process, menu level back, in measuring menu: Light on
⑧ Select reading 2 (bottom line), select menu item
⑨ Hold reading value, display maximum/minimum/mean value

Connections

① Socket “1” and ② socket “2”: Thermocouple probe (type K), NTC probe, pressure probe, power supply cable
③ “RS232”: PC connection
④ 12 V DC mains unit (0554 0088)
⑤ Pressure nipple p+ with quick-release connection (M8 x 0.5) (only for testo 526)
⑥ Pressure nipple p- with quick-release connection (M8 x 0.5) (only for testo 526)



Display

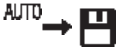
① Header (see detailed explanation of icons below: Icons in the header)
② Designation of internal sensor or input socket 1 with selected channel and parameter unit
③ Reading 1
④ Designation of input socket 1 or 2 with selected channel and parameter unit
⑤ Reading 2
⑥ Measuring functions

Icons in the header:

M. Counter for identifying the stored logs in the case of manual, automatic and fast storage of the measurement series.

N 0000 Counter for identifying the measurements in a measurement series in the case of automatic and fast storage.

Appears: manual saving set.
Flashes: current readings saved.



Appears: automatic saving set.
Flashes: automatic saving running.

The memory content will be cleared.

Appears: printing possible.
Flashes: print function activated.

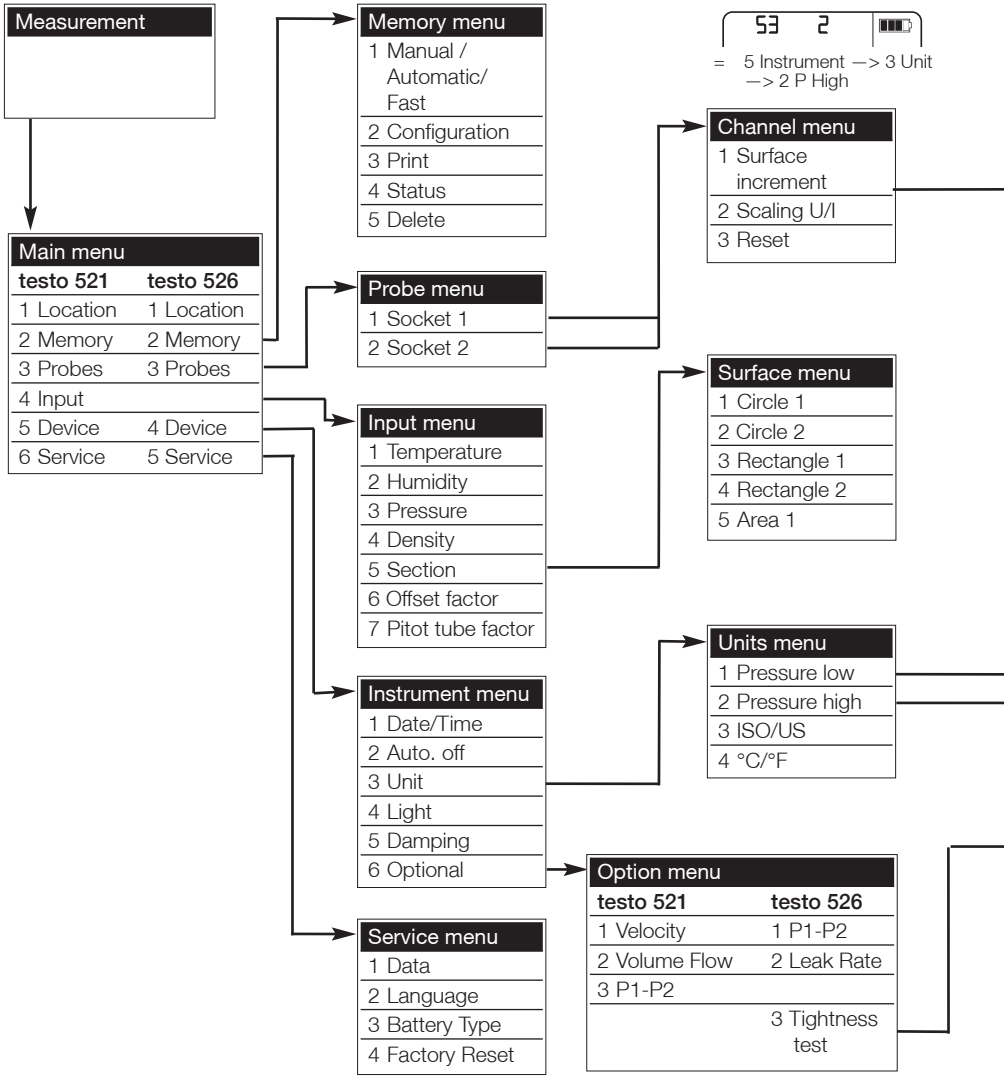
Battery/rechargeable batter capacity:
All segments dark: rechargeable battery/battery full.

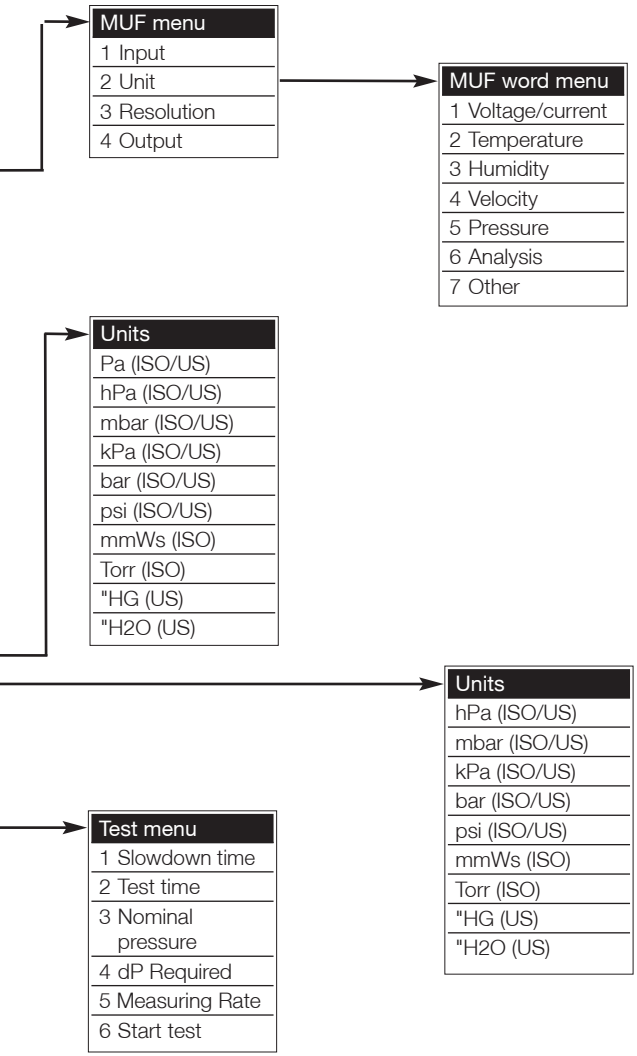
All segments light, flashing: Battery/rechargeable battery empty. The instrument switches off automatically after 1 min.

3.3 Menu overview

OK : Open menu, ▲ ▼ : Select menu, ESC LIGHT : Back

The menu numbers appear in the topmost line of the display. **Example: testo 521**




MUF menu
1 Input
2 Unit
3 Resolution
4 Output
MUF word menu
1 Voltage/current
2 Temperature
3 Humidity
4 Velocity
5 Pressure
6 Analysis
7 Other
Units
Pa (ISO/US)
hPa (ISO/US)
mbar (ISO/US)
kPa (ISO/US)
bar (ISO/US)
psi (ISO/US)
mmWs (ISO)
Torr (ISO)
"HG (US)
"H2O (US)
Units
hPa (ISO/US)
mbar (ISO/US)
kPa (ISO/US)
bar (ISO/US)
psi (ISO/US)
mmWs (ISO)
Torr (ISO)
"HG (US)
"H2O (US)
Test menu
1 Slowdown time
2 Test time
3 Nominal pressure
4 dP Required
5 Measuring Rate
6 Start test

4. Commissioning

Caution

Charge batteries properly!

Danger of explosion!

▶ Only start the charging process if a rechargeable battery is in the instrument and **Rech.** has been set as the battery type.

4.1 Inserting the battery/ rechargeable battery

(Rechargeable battery type: NiMH IEC 6F22)

1 Open the battery compartment on the rear of the instrument.

2 Insert the monobloc battery/rechargeable battery. Observe +/-.

3 Close the battery compartment.

! To avoid the loss of data, it is imperative that you switch the instrument off when changing the battery/rechargeable battery and replace the battery in < 10 min.

4.2 Using the power unit

The instrument can be operated with mains unit 0554 0088, without a battery/rechargeable battery.

! The instrument switches on automatically when the power unit is connected.

It is normal for the mains unit to warm up. The mains unit has a thermostatic switch to protect it against overheating.

4.3 Connecting probes/sensors

Connect the probes/sensors before switching the instrument on. Probe-specific characteristics are only read in when the instrument is switched on. Make sure the connections are secure, but do not use force!

- ▶ Connect the plug/hoses of the probes/sensors to the corresponding connections of the instrument:

1 Pressure hoses at p+ and p-

Caution

Make sure the pressure hose does not jump away from the connection socket!

Risk of injury!

- ▶ Always use the screw locking device to secure the pressure hose at pressures above 700 hPa.

2 Socket "1" and socket "2":
Thermocouple probe (type K), NTC probe, pressure probe, power supply cable

5. Basic operating steps

5.1 Switching on/off

Switching on

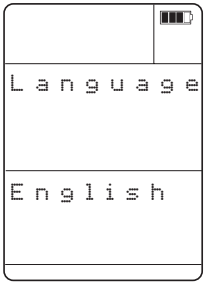
- Connect the required probes/sensors before switching on.

1 Switch the instrument on with [⏻].

① A display test will follow: all segments of the display will light up for approx. 1 sec.

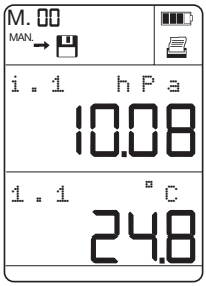
② Automatic probe detection will be carried out. The supply voltage and the actual time will be displayed.

③ Set the language in which the menus are to be displayed.



! You must set the language before the instrument is used for the first time or after a factory reset.

Select the language with [▲] or [▼] and confirm with [OK]. The selection is stored and will be displayed automatically the next time the instrument is switched on.
You can change a menu setting later via the menu item Service->Language.



④ The current readings are displayed. The instrument is now operational.

- The reading of the internal sensor is displayed in the upper line.
- The reading of an externally connected probe appears in the lower line.
- If two probes are connected externally, the measurement of the internal sensor is deactivated.
  -Left probe socket: upper line
  -Right probe socket: lower line

Switching off

Readings which are not saved will be lost when the instrument is switched off!

▶ Switch the instrument off with [I/O].

5.2 Menu navigation

Operation is organised into 3 levels:

- Measurement menu
- Main and submenus
- Configuration menus

1 Open the main menu with [OK] and return to the measurement menu with [ESC LIGHT] .

2 Select the menu with [▲] or [▼] and confirm with [OK].

3 Repeat step 2 until you reach the function level.

4 You can make entries with [▲] or [▼] , depending on the menu item. Confirm the entry with [OK].

- The current value will be displayed.

Details about the setting and adjustment options for the individual functions can be found under 6. Menu functions.

▶ Go back one menu level with [ESC LIGHT].

6. Menu functions

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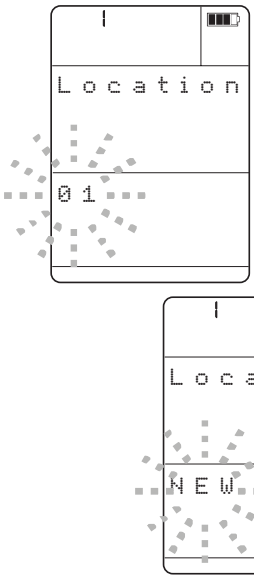
6.1 Measurement site



1 Choose the **measurement location** In the main menu with ▲ or ▼ .

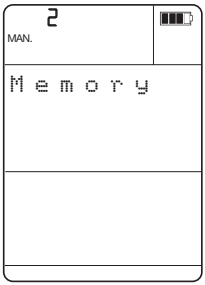
- The location that is currently set will be displayed. If a measurement location was allocated via the **testo ComSoft** software, this is displayed as well.
- If data is already stored for the chosen location, 💾 illuminates.

2 Activate setting mode with OK .

- The measurement location that is currently set flashes.
- A location is created when the unit is first commissioned. Up to 98 additional locations can be added. Press the ▲ key until NEW appears in the lower line. Confirm with OK . A new measurement location has been created.

3 Select the desired measurement location with ▲ or ▼ and confirm the selection with OK .

- Adjustable values flash.



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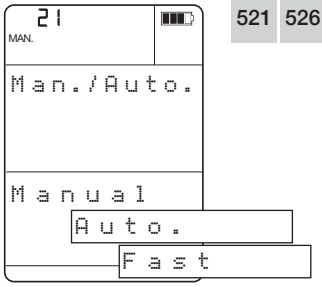
6.2 Memory

In the main menu, choose the **measurement location** with ▲ or ▼ .

Select required location with ▲ or ▼

and confirm with OK .

1 In the main menu, select **Memory** with ▲ or ▼ and confirm the selection with OK .
2 Select the desired function with ▲ or ▼ .
3 Activate setting mode with OK .
- Adjustable values flash.



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6.2.1 Man./Auto./Fast

Press ▲ or ▼ to select **Manual**, **Automatic** or **Fast** and confirm the selection with OK .

- **Manual**
  save current readings
- **Automatic**
  start a measurement program that will be saved
- **Fast**
  save 25 measurements per second automatically

! Only 1 channel can be analysed during a fast measurement. Fast measurement only possible with pressure probes or internal pressure sensor. The following order applies during the fast measurement:
- External pressure sensor before internal pressure sensor
- Channel 2 before Channel 1.

Start the required save with the 💾 key. The save process is indicated by a flashing memory icon in the display. Cancel saving with the 💾 key.

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6.2.2 Configuration

(only available in the Fast/Automatic measurement program)

Set how the measurement program is to function.

Measurement program Auto.

4 Set the measuring rate in hrs., min. and sec. with ▲ or ▼ . Hold the key down to go forward/back quickly. Every time 60:00 min. is passed, the hour value increases. Confirm the selection with OK .

5 Select the number of measurements with ▲ or ▼ (hold the key down to go forward/back quickly) and confirm the selection with OK . The duration of the measurement series is displayed in the upper line for your information.

Measurement program Fast (20 measurements per sec.)

4 Select the number of measurements with ▲ or ▼ (hold the key down to go forward/back quickly) and confirm the selection with OK .

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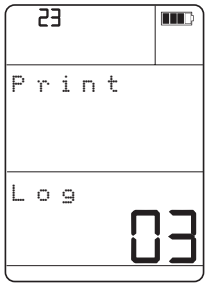


6.2.3 Printing

The logs stored for a measurement location, e.g. the reading and other available parameters (density, temperature, humidity, pressure, cross-section, offset factor, Pitot tube factor) are printed.

4 Select the log with ▲ or ▼ (hold the key down to go forward/back quickly) and confirm the selection with OK .

5 Printout starts

- The data is sent to the printer via the infrared interface. 🖷 flashes during data transmission.

! If the 🖷 key in the measurement menu is pressed, the reading currently stored is printed out.

! If no log is stored the display shows “Error”.

```
Date: 27.08.2003
Time: 10:15:35

Testo AG

Location:  01

Meas. from: 27.08.2003
Time: 10:15:35

1.1:  918 hPa
2.1:  27.0 °C
```

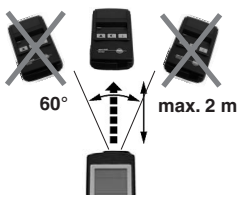
Printout of current reading in the measurement menu

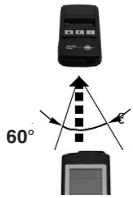
```
Date: 27.08.2003
Time: 10:15:35

Testo AG

Location: 01

     Date         Time
from: 27.08.2003  10:15:35
to: 27.08.2003    10:25:35

          hh:mm:ss
Meas. rate : 00:01:00

1.1: hPa  2.1: °C
00001 27.08.2003  10:15:35
01       917
   26.8
02       918
   26.8
03       917
   26.8
04       917
   26.8
05       917
   26.8
06       917
```

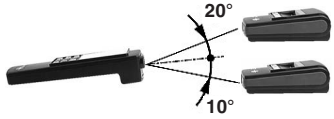
Printout after measurement has finished

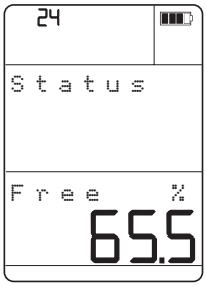
6.2.3.1 Data transfer

! The transmission path should not be obstructed by obstacles of any kind.









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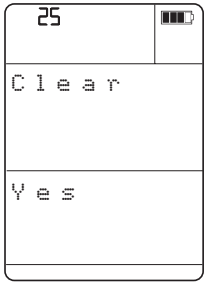
6.2.4 Status

Indicates the available memory space as a %.



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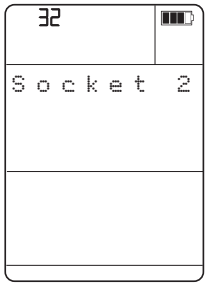
6.2.5 Clearing

The Clear menu item allows the entire memory to be cleared.

- It is not possible to clear individual logs or measurement locations.

4 Select **Yes** or **No** with ▲ or ▼ and confirm the selection with OK .

- If you select **Yes**: the memory content will be cleared.
- If you select **No** or ESC LIGHT: the process will be cancelled.



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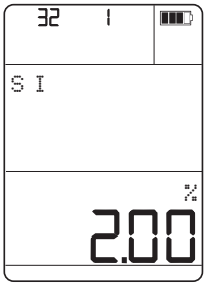
6.3 Probes

! Menu is activated only if external probes are connected.

1 In the main menu, select **Probes** with ▲ or ▼ and confirm the selection with OK .
2 Select the desired socket with ▲ or ▼ and confirm the selection with OK .
3 Select the desired function with ▲ or ▼ .
4 Activate setting mode with OK .

The following control operations for the functions **Surface increment**, **Scaling U/I** and **Probe reset** apply equally for the **Socket 1** and **Socket 2** menus.

! Different units are available, depending on which standard was chosen (**ISO** or **US**). See 6.6.3 Unit



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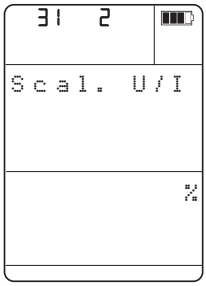
6.3.1 Surface increment (SI)

This function is only visible if a temperature probe is connected.
Set which surface increment (SI) is to be calculated in addition to a surface increment stored in the probe.

! The surface increment is the percentage increment for the measured thermocouple voltage of surface probes.

5 Select the increment (0 - 30 %) with ▲ or ▼ . Hold the key down to move forward/back quickly. Confirm the selection with OK .



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6.3.2 Scaling U/I

This function is only visible if the 4 - 20 mA interface (0554 0528) or the power supply cable (0554 0007) is connected.

Select the scaling factors for the transmitter.

5 Select Scal. U/I with ▲ or ▼ and confirm the selection with OK .

6 Activate the "Input", "Unit", "Resolution" or "Output" menus with OK .

7 Select parameters with ▲ or ▼ and confirm the selection with OK .

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Input

- 0 V - 10 V (for power supply cable 0554 0007)
- 0 V - 1 V (for power supply cable 0554 0007)
- 4 mA - 20 mA (for power supply cable 0554 0007 or 4 - 20 mA interface 0554 0528)
- 0 mA - 20 mA (for power supply cable 0554 0007 or 4 - 20 mA interface 0554 0528)

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Units

Menu	Units									
U/I	V	mA	A	mV						
Temp.	°C	°F								
Humidity	%	°Ctd	g/m³	g/kg	°Ftd					
Velocity	m/sec	m³/hr	fpm	cfm						
Pressure	Pa	psi	Torr	mmWS	kPa	mbar	bar	hPa	"H2O	"HG
Analysis	mS	mg/l	pH	µS						
Other	1/m	User	%	ppm	kHz					

521 526 *Resolution*

Selecting decimal places

Place	Min. value		Max. value
0	-9999	to	99999
1	-999.9	to	9999.9
2	-99.99	to	999.99

521 526 *Setting the output*

Scaling takes place when the unit has been selected.

Example: 4 - 20 mA should correspond to
0 - 100 % in the subsequent display.

Entering the min. value

Set the 4 mA value (corresponds to 0%) with ▲ or ▼ = 0 % (hold the key down to move forward/back quickly) and confirm the selection with OK.

Entering the max. value

Set e.g. the 20 mA value (corresponds to 100 %) with ▲ or ▼ (hold the key down to move forward/back quickly) and confirm the selection with OK.

521 526 **6.3.3 F-Reset**

Select whether you want to reset the probe/sensor data to the standard values (factory setting).

5 Select Yes or No with ▼ or ▲ and confirm the selection with OK.

- If you select Yes: probe/sensor data will be reset.
  If you select No or ESC LIGHT: the process will be cancelled.

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6.4 Input

For velocity measurement with the Pitot tube, the internal pressure sensor 0 - 100 hPa is the best for velocities from 5 - 100 m/s. For measurements in the range of 1 - 12 m/sec., use the external differential pressure probe 0638 1347 with measuring range 0 - 100 Pa. The velocity v is calculated in the instrument from the pressure difference Δp in the Pitot tube according to the following formula:

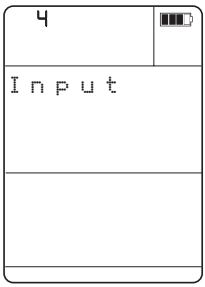
$$v\ [m/sec.] = S \times \sqrt{\frac{200000 \times \Delta p\ [hPa]}{rho\ [g/m^3]}}$$

To activate the velocity rate measurement and volume flow rate calculation, please refer to chapter 6.5.6. Alternatively, it is possible to enter the variables which influence the air density at the measuring location:
- temperature (see point 6.4.1)
- relative humidity (see point 6.4.2)
- absolute pressure (see point 6.4.3)

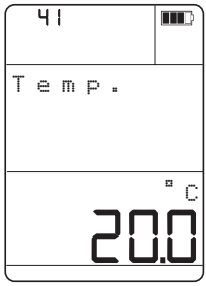
Additional input options for calculating the velocity or volume flow rate are the
- cross-section (see point 6.4.5)
- offset factor (see point 6.4.6)
  Calculation formula:

$$\dot{V}\ [m^3/h] = K \times v\ [m/s] \times A\ [m^2] \times 3600$$

- Pitot tube factor (see point 6.4.7)



1 In the main menu, select **Input** with ▲ or ▼ and confirm the selection with OK.
2 Select the required function with ▲ or ▼ .
3 Activate setting mode with OK.



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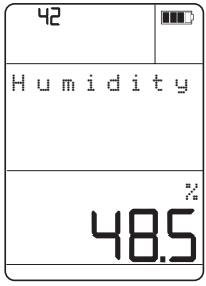
6.4.1 Temperature

Set the temperature which is to be used to calculate the density.

4 Select the temperature with ▲ or ▼ . (-100 °C - 800 °C) (hold the key down to go forward/back quickly) and confirm the selection with OK .



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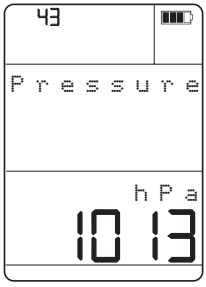
6.4.2 Relative humidity

Set the humidity which is to be used to calculate the density.

4 Select the humidity (0 - 100 %) with ▲ or ▼ (hold the key down to go forward/back quickly) and confirm the selection with OK .



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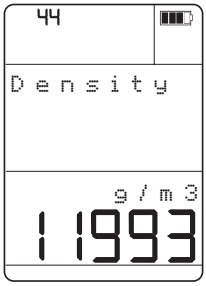
6.4.3 Absolute pressure

Set the absolute pressure which is to be used to calculate the density.

4 Select the pressure (400 - 4000 hPa) with ▲ or ▼ (hold the key down to go forward/back quickly) and confirm the selection with OK .



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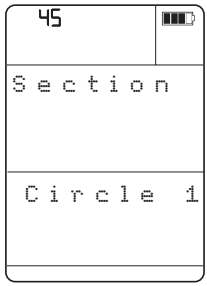
6.4.4 Density

The density is calculated automatically after the factors of **temperature**, **humidity** and **absolute pressure** have been entered. If you set the value for the density directly, no values are displayed for **temperature**, **humidity** and **pressure** (display: - - - - -).

4 Select the density (1 - 9999.9g/m^3) with ▲ or ▼ (hold the key down to go forward/back quickly) and confirm the selection with OK .



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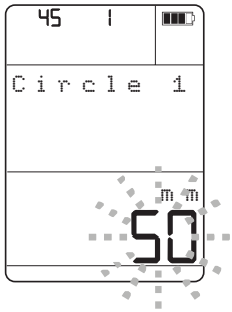


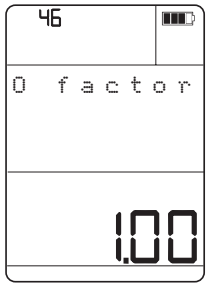
6.4.5 Cross-section

Set the cross-section for

- circle 1 (Ø in mm)
- circle 2 (Ø in mm)
- rectangle 1 (a x b/height x width in mm or inch)
- rectangle 2 (a x b/height x width in mm or inch)
- area (m^2)

that is to be used to calculate the volume flow rate. The shapes listed are contained in the instrument as standard. The shapes can be changed using the software (e.g. five circles).

4 Select the desired function with ▲ or ▼.
5 Activate setting mode with OK.
6 Select the value with ▲ or ▼ (hold the key down to go forward/back quickly) and confirm the selection with OK.
7 Enter the next cross-section. To set the next values, repeat steps 2 - 6 .



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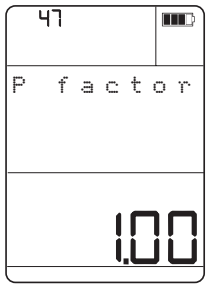
6.4.6 Offset factor (O factor)

Set the offset factor that will be used to calculate readings. The factor is stored with the cross-section. The factor changes when another cross-section is activated. The O factor depends on the outlet. The K factor affects the calculated volume flow directly. For standard applications the factor should be 1.

4 Select the O factor (0.01 - 10) with ▲ or ▼ (hold the key down to go forward/back quickly) and confirm the selection with OK.



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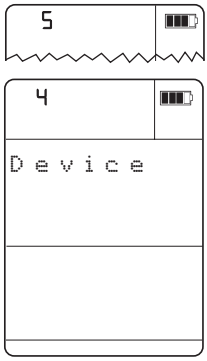
6.4.7 Pitot tube factor (P factor)

Set the Pitot tube factor that will be used to calculate readings.

- Testo standard Pitot tube (Prandl), factor 1
- Straight Pitot tubes, factor 0.67

4 Select the P factor (0.01 - 500) with ▲ or ▼ (hold the key down to go forward/back quickly) and confirm the selection with OK.

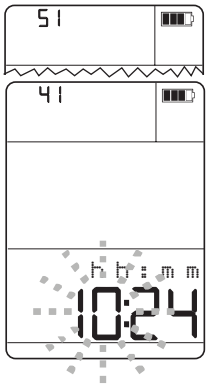


6.5 Instrument

In the main menu, select **Instrument** with ▲ or ▼ and confirm the selection with OK.

2 Select the desired function/menu with ▲ or ▼.
Select **Optional**:
Confirm the selection with OK and select the desired function with ▲ or ▼.

3 Activate setting mode with OK.

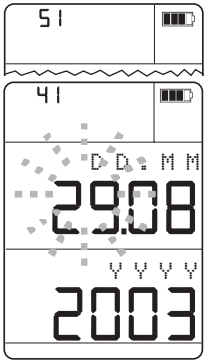


6.5.1 Time

Set the time and date.

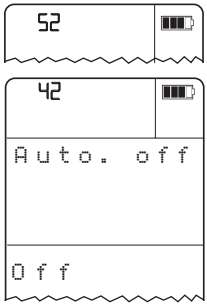
Time

4 Set the hour with ▲ or ▼ (hold the key down to go forward/back quickly). The value to be changed flashes. Confirm the setting with OK. Repeat this step to set the minutes.



Date

5 Set the day with ▲ or ▼ (hold the key down to go forward/back quickly). The value to be changed flashes. Confirm the setting with OK. Repeat the step to set the month and year.



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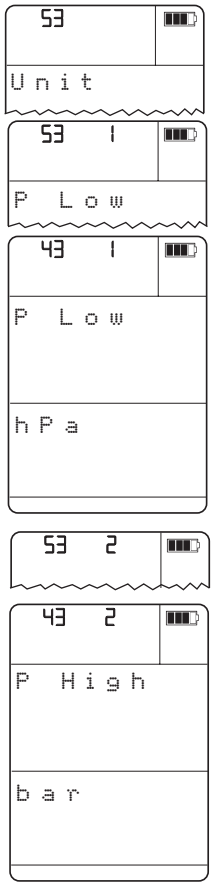
6.5.2 Auto. Off

Set whether the instrument is to switch off automatically after 10 min. without any key being pressed.

4 Select **On** or **Off** with ▲ or ▼ and confirm the selection with OK .

- If you select **On**: the instrument will switch off automatically after 10 min.
  If you select **Off**: the instrument will not switch off automatically.



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6.5.3 Unit

Low pressure (P low) (probe up to 2000 hPa)
Set the unit in which the pressure is to be displayed. The selected unit will be displayed in measurements with the internal pressure sensor and all external pressure probes (differential and absolute pressure probes) with a measuring range between 0 - 2000 hPa.

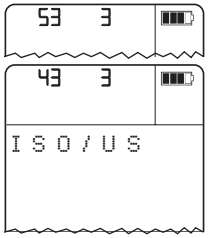
The following units are available:
- hPa, Pa, psi, Torr, kPa, mbar, bar for ISO/US
- Torr, mmWs for ISO
- "H2O, "HG for US

4 Select the desired unit with ▲ or ▼ and confirm the selection with OK .

High-pressure (P high) (probe from 2000 hPa). Set the unit in which the pressure is to be displayed. The selected unit will be displayed in measurements with the external relative pressure probes with a measuring range between -1 and +400 bar.

The following units are available:
- hPa, psi, kPa, mbar, bar for ISO/US
- Torr, mmWs for ISO
- "H2O, "HG for US

4 Select the required unit with ▲ or ▼ and confirm the selection with OK .

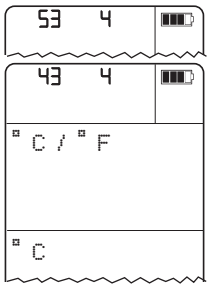


ISO/US

Set whether European (metric) or US units are to be displayed.

The following units will be converted:
- m^2 - ft^2, mm - inch, g/m^3 - gr/ft^3, m/sec. - fpm, m^3/h - cfm, units of pressure

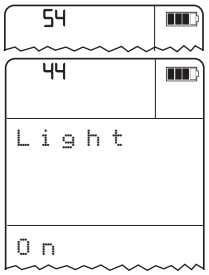
4 Select ISO or US with ▲ or ▼ and confirm the selection with OK.



°C/°F

Set whether temperatures are to be displayed in units of °C or °F.

4 Select °C or °F with ▲ or ▼ and confirm the selection with OK.

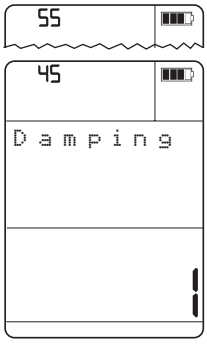


6.5.4 Display lighting

Set whether the display light is to go on for 30 sec. when any key is pressed.

4 Select On or Off with ▲ or ▼ and confirm the selection with OK.

If Off is selected, the light will not go on when the key ESC LIGHT is pressed.



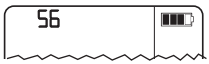
6.5.5 Damping

If the readings fluctuate widely, it is advisable to damp the readings.

Set the damping which is to be used to calculate readings.

! Damping is the sliding mean calculation over n values (n can be set in instrument).

4 Set damping (1 - 20) with ▲ or ▼ (hold the key down to go forward/back quickly) and confirm the selection with OK.



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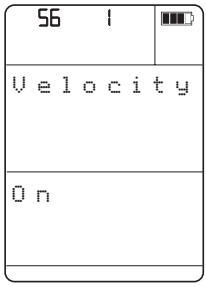
6.5.6 Optional



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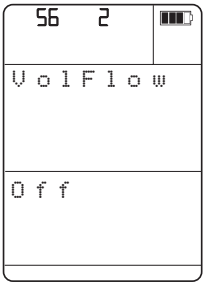
Velocity

Set whether the calculated velocity is to be shown on the display.

4 Select **On** or **Off** with ▲ or ▼ and confirm the selection with OK.

- If you select **On**: the calculated velocity will be shown on the display.
  If you select **Off**: the calculated velocity will not be shown on the display. Volume flow is automatically at **Off**.



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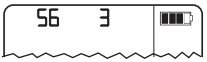
Volume flow

Set whether the calculated volume flow is to be shown on the display.

4 Select **On** or **Off** with ▲ or ▼ and confirm the selection with OK.

- If you select **On**: the calculated volume flow will be shown on the display. Flow is activated automatically.
  If you select **Off**: the calculated volume flow will not be shown on the display.



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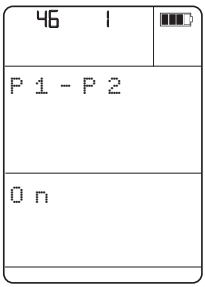

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Delta P

Set whether the differential pressure of two pressure probes is to be shown on the display.

Calculating the differential pressure (P1-P2):
If one external pressure probe is connected, the differential pressure is calculated from the internal pressure sensor (P1) and external pressure probe (P2). If two external pressure probes are connected, the internal pressure sensor is deactivated. The differential pressure is calculated from the external pressure probes.

4 Select On or Off with ▲ or ▼ and confirm the selection with OK.

- If you select On: the differential pressure will be shown on the display.
  If you select Off: the differential pressure will not be shown on the display.

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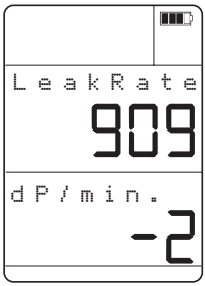
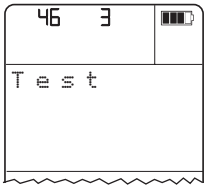


Leakage rate

Set whether the leakage rate (Δp/hr. or Δp/min.) is to be calculated and shown on the display. The leakage rate is always calculated for just one channel. The channel to be measured is selected automatically according to the following rule:
- external probe before internal probe
- measuring channel 1 before measuring channel 2

4 Select Δp/hr. or Δp/min. with ▲ or ▼ and confirm the selection with OK.

Measurement starts and the pressure reading is displayed immediately. After about 10 sec. the first pressure difference will be displayed and updated continuously. Measurement can be restarted at any time by pressing the key P=0. Press OK or ESC LIGHT to end measurement.



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Tightness test

The tightness test menu is used in order to analyse the pressure loss of the vessel, pipes, lines etc.

The steps for performing the tightness test " The tightness test menu is used in order to analyse the pressure loss of the vessel, pipes, lines etc.

The steps for performing the tightness test “Test with air”, based on the standard DIN EN1610 “Construction and testing of drains and sewers”, are outlined in the instrument menu:

- Enter the set slowdown time (tSlDoReq)
- Enter the set test time (tTestReq)
- Enter the set test pressure at which the measurement is to take place (P Req.)
- Enter the permitted pressure drop Δp in hPa that is critical in order to assess whether the pipeline is leaking or not (ΔP Req.)

The test can start once the required values according to the standard have been entered. It is divided into 5 areas:

Time zone areas:

- Pre-fill time
  Build-up of the pressure in the pipe system and the actual duration.
- Slowdown time
  Measurement of the pressure, which should exceed the test pressure required by the standard by about

10 % over 5 min. and which records the actual duration.

- Test time
  Record of the actual test duration.
- Drop time
  Record of the duration of the pressure drop in the line.

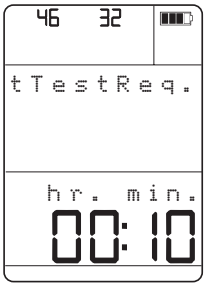
When the test has come to an end the individual required and actual test data can be printed out on the printer or automatically imported into a test log via the ComSoft software.

Slowdown time (tSlDoReq)

Set the required time. According to DIN EN1610, it should be about 5 min.:

A starting pressure that exceeds the necessary test pressure p_0 by about 10 %. p_0 must first be maintained for 5 min.

4 Select tSlDoReq (0 sec. to 99 min., 59 sec.) with ▲ or ▼ (hold the key down to move forward/back quickly. Confirm the selection with OK. You automatically return to the tTestReq menu.



Test time (tTestReq)

Set the test time during which the pressure drop is monitored. The test time is taken from DIN EN 1610 (see table below).

5 Activate setting mode with [OK]. Select tTestReq (1 min. to 99 hr., 59 min.) with [▲] or [▼] (hold the key down to more forward/back quickly) Confirm the selection with [OK].
You automatically return to the P Req. menu.

Test pressure, pressure drop and test times for testing with air

Material	Method	Po* in mbar (kPa)	Δp in mbar (kPa)	Test time (min.) for DN 100	DN 150	DN 200	DN 300	DN 400	DN 600	DN 800	DN 1000	DN 1200
Dry concrete pipes	LA	10 (1)	2.5 (0.25)	5	5	5	5	7	11	14	18	22
	LB	50 (5)	10 (1)	4	4	4	4	6	8	11	14	17
	LC	100 (10)	15 (1.5)	3	3	3	3	4	6	8	10	12
	LD	200 (20)	15 (1.5)	1.5	1.5	1.5	1.5	2	3	4	5	6
K_p x value**				0.058		0.058	0.053	0.040	0.0267	0.020	0.016	0.013
Moist concrete pipes and all other materials	LA	10 (1)	2.5 (0.25)	5	5	5	7	10	14	19	24	29
	LB	50 (5)	10 (1)	4	4	4	6	7	11	15	19	22
	LC	100 (10)	15 (1.5)	3	3	3	4	5	8	11	14	16
	LC	200 (20)	15 (1.5)	1.5	1.5	1.5	2	2.5	4	5	7	8
K_p x value**				0.058		0.058	0.040	0.030	0.020	0.015	0.0012	0.010

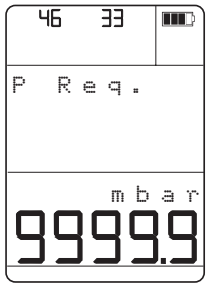
* Pressure above atmospheric pressure

** $t = \frac{1}{K_p} \times \ln \frac{P_o}{P_o - \Delta_p}$

For dry concrete pipes $K_p = \frac{16}{DN}$ with a maximum value of 0.058.

For moist concrete pipes and all other materials $K_p = \frac{12}{DN}$ with a maximum value of 0.058, where $t < 5$ min. rounded to the nearest 0.5 minutes and $t > 5$ min. rounded to the nearest minute.

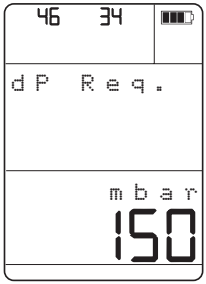
$\ln = \log_0$



Required test pressure p_o (P Req.)

Set the required test pressure at which measurement is carried out. Required test pressure according to DIN EN1610 (see table on previous page).

6 Activate setting mode with OK. Select the P Req. value with ▲ or ▼ (example: 0.0mbar to 9999.9mbar) (hold the key down to move forward/back quickly. Confirm the selection with OK. You automatically return to the menu.

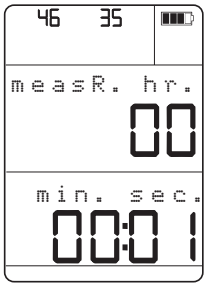


Permitted pressure drop ΔP (ΔP Req.)

Set the maximum permitted pressure drop ΔP. At the end of measurement, this value is used to decide whether the test piece is leaking or not. Required pressure drop ΔP according to DIN EN1610 (see table on page 33).

7 Activate setting mode with OK. Select the ΔP Req. value with ▲ or ▼ (example: 0.0mbar to 9999mbar) (hold the key down to move forward/back quickly). Confirm the selection with OK.

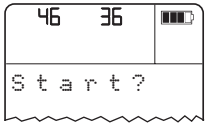
You automatically jump to the measuring rate menu.



Measuring rate

Set the measuring cycle at which the changes in pressure are recorded.

8 Activate setting mode with OK. Select the measuring rate (1 sec to 24h) with ▲ or ▼ (hold the key down to move forward/back quickly. Confirm the selection with OK.

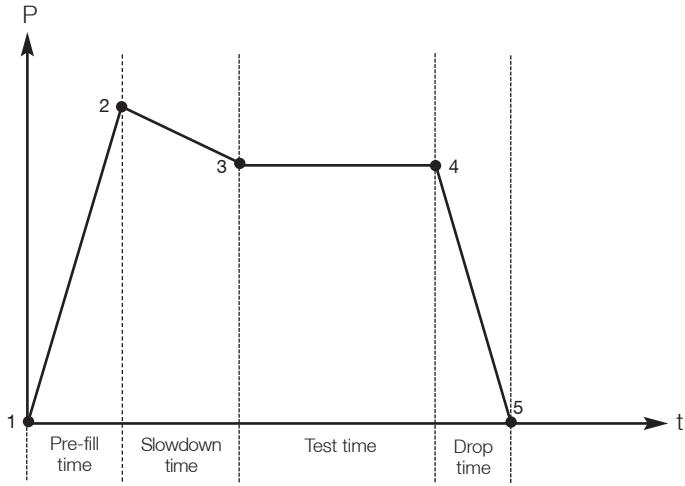


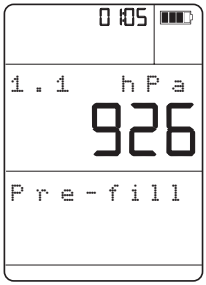
Start

Start the test with the set parameters.
The entire measurement process is stored in the instrument.

9 Activate start mode with OK.
Cancel testing with ESC LIGHT.

Graphic overview of the measurement process

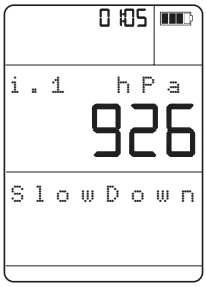




Phase 1: Pre-fill time

Build-up of the pressure in the pipe system and the actual duration.

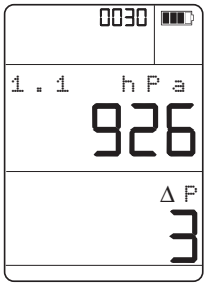
Jump to the slowdown time menu automatically with OK.



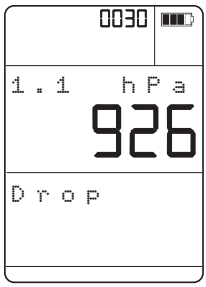
Phase 2: Slowdown time

Measurement of the pressure, which should exceed the test pressure required by the standard by about 10 % over 5 min. and which records the actual duration.

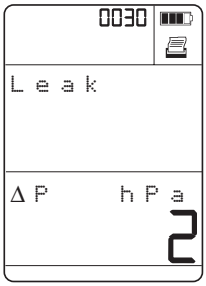
Jump to the test time time menu automatically with OK.



Phase 3: Test time
Recording of the actual test duration.
Jump to the drop time menu automatically with OK .

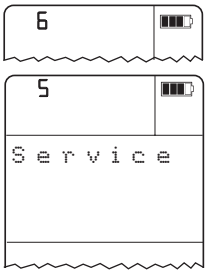


Phase 4: Drop time
Record of the duration of the pressure drop in the line.
Jump to the end of measurement menu automatically with OK .



Phase 5: End of measurement
At the end of measurement, the full pressure difference is displayed and the readings are analysed in order to determine whether or not the system is to be classed as leaking.
Press the key to print out the measurement result. All values are given in bar to enable comparison.

Return to the measurement menu with OK . The last log to be saved is displayed.



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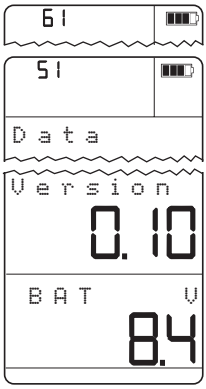
6.6 Service

1 In the main menu, select **Service** with ▲ or ▼ and confirm the selection with OK.

2 Select the required function/menu with ▲ or ▼.
Confirm the selection with OK and select the required function with ▲ or ▼.

3 Activate setting mode with OK.



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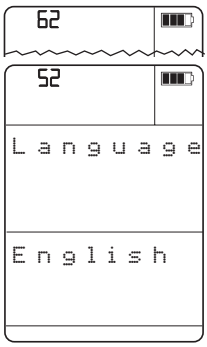
6.6.1 Data

Indicates the battery voltage and firmware version. When the 🖶 key is pressed all information stored in the instrument will be printed out.

Printout data

```
Date: 27.08.2003
Time: 10:15:35

Testo AG

Location: 01

Data

Mustermann
Max
Testo Str. 1
Testo AG
07653/681-0

InstrumentType    :        t521
Version           :        0.14
Serial number     :    00000021
Battery           :         8.5V

Memory:   Manual
          hh:mm:ss
Measr.:    00:01:00
Free :     78%

U/I 1:
Input :   0mA - 20mA
Output:   0.0 - 20.0
Unit  :

U/I 2:
Input :   0mA - 20mA
Output:   0.0 - 20.0
Unit:

Temp.     : 20.0 °C
Humidity  : 50.0 %
Pressure  : 1013 hPa
Density   : 1199.0 g/m³
P factor  : 1.00
Section.  : 0.002 m²
O factor  : 1.00
```



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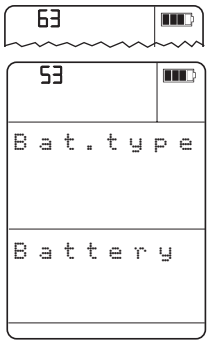
6.6.2 Language

Set the language in which the menus are to be displayed.
The following languages are available: German, English, Italian, Spanish, Portuguese, French, Dutch, Swedish

4 Select the language required with ▲ or ▼ and confirm the selection with OK.



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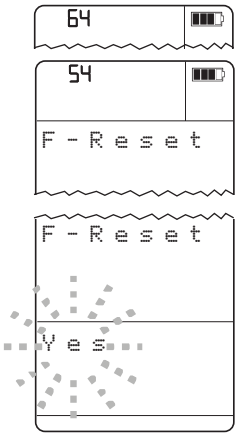
6.6.3 Bat. type

Set whether an ordinary battery or a rechargeable battery is inserted in the instrument.

! The battery in the instrument can only be recharged if it is a rechargeable battery and this is set as the battery type.

▶ Only set the battery type as **Rech.** if a rechargeable battery is actually fitted in the instrument.

4 Select **Battery** or **Rech.** with ▲ or ▼ and confirm the selection with OK.



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6.6.4 F-Reset

Choose whether you want to reset the instrument settings to the defaults (factory settings).

! The internal memory is cleared when an F-Reset is carried out.

The following values are reset in the instrument:

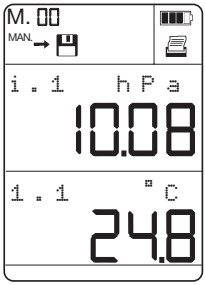
Auto. off:	On
Lighting:	Off
Temperature:	20 °C
Humidity:	50 % RH
Absolute pressure:	1013 hPa
Density:	1199 g/m³
Area:	1 m²
Pitot tube factor:	1
Offset factor:	1
Unit of temperature:	°C
Units:	ISO
Unit of pressure:	hPa
Saving:	manual
Battery type:	Battery
Language:	English
Damping:	1 = no damping

No calculated parameters activated

4 Select **Yes** or **No** with ▲ or ▼ and confirm the selection with OK.

- If you select **Yes**: the instrument settings are reset to the defaults (factory settings).
  If you select **No** or ESC LIGHT the instrument settings are not reset.

7. Measuring

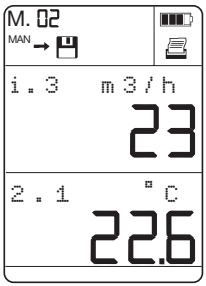


521 526

7.1 Zeroing the display

For the display of the internal pressure to be zeroed, the instrument must be in the measurement menu and there must be a differential pressure of < 2.5 % of the full-scale value (at testo 5213 reset <20% of the full scale value). Please refer to the Instruction manual for the pressure probe to find out which part of the external pressure probes can be zeroed.

▶ Zero the display values of all connected (zeroable) pressure probes with [P=0].



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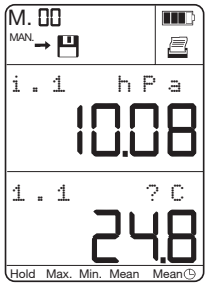
! Zeroing is lost when the instrument is switched off.

7.2 Selecting readings

If velocity or volume flow is activated, these values are displayed in the upper line by pressing the [▲] key.

▶ Select required reading 2 (bottom line) with [▼].



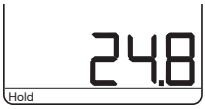
521 526

7.3 Activating measuring functions

The instrument has the following measuring functions:

- Hold value (**Hold**)
- Display maximum value (**Max.**)
- Display minimum value (**Min.**)
- Calculate spot mean value (**Mean**)
- Calculate chronological mean (**Mean** ◷)

For the measuring functions to be called up, the instrument must be in the measurement menu.



521 526

▶ Select the measuring functions one after the other with [HOLD MAX/MIN MEAN]:

Hold

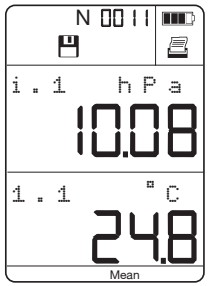
The last readings are held in the display.

521 526

Max.
The highest readings since the start of measurement are displayed.

521 526

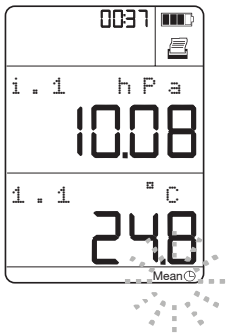
Min.
The lowest readings since the start of measurement are displayed.



521 526

Mean

1 Activate calculation of the spot mean value with OK.
- Mean flashes.
2 Record the reading for the calculation with OK.
3 Repeat step 2 as required.
- The number of recorded readings is shown in the topmost line in the display.
4 Calculate the spot mean value with HOLD MAX/MIN MEAN.
- The calculated mean value is displayed and can be stored or printed out.
  - Save readings with 💾
  - Print readings with 🖶
▶ Reactivate calculation of the mean value with OK and record additional readings with OK.
▶ Cancel the process with ESC LIGHT.



521 526

Mean ◷

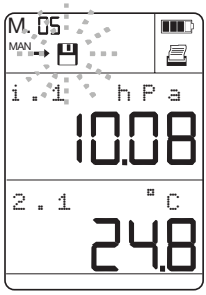
1 Activate calculation of the chronological mean value with OK.
2 Start recording readings with OK.
- Mean ◷ flashes.
- A reading is recorded every second. The duration since the readings started being recorded is shown in the topmost line of the display.
3 Stop calculation of the mean values with OK.
4 Calculate the chronological mean values with HOLD MAX/MIN MEAN.
- The calculated mean value is displayed and can be stored or printed out.
  - Save readings with 💾.
  - Print readings with 🖶.

- ▶ Reactivate calculation of the mean value with [OK] and continue recording the measurement readings with [OK] .
- ▶ Cancel the process with [ESC LIGHT].

521 526

7.4 Saving readings

For the readings to be saved, the instrument must be in the measurement menu.

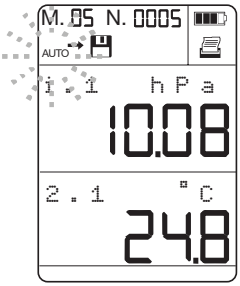


! Before you save the readings, you must select the measurement location under which the data is to be saved (see 6.1 Measurement location).

Manual save mode set (see 6.2.1 Man./Auto.):

4 Press [💾] to save the current readings with the date, time, measurement location and other available parameters.

- MAN→💾 flashes briefly.

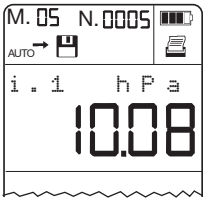


.

Automatic save mode set (see 6.2.1 Man./Auto.):

4 Press [💾] to start the set measurement program.

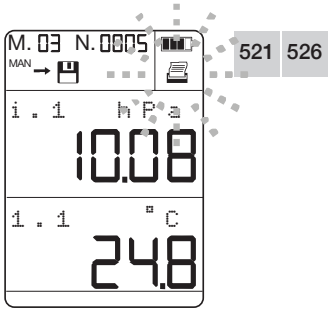
- AUTO.→💾 flashes for as long as the measurement program is running. The save program can be ended early by pressing [💾] . Press again to save a new series of measurements.



Fast save mode set (see 6.2.1 Man./Auto.):

4 Press [💾] to start the set measurement program.

- 25 measurements are saved per sec. automatically.



7.5 Printing readings

To print all readings stored for a measurement location (see 6.2.3 Printing)

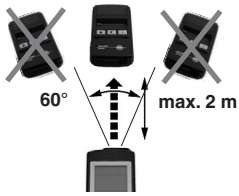
To print individual readings, the instrument must be in the measurement menu.

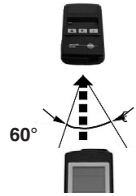
4 Press [🖶] to print out the current readings with the date, time, measurement location and other available parameters.

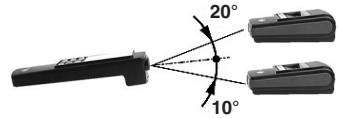
- The data is sent to the printer via the infrared interface. 🖶 flashes during data transmission.

Data transfer

! The transmission path should not be obstructed by obstacles of any kind.







8. Care and maintenance

8.1 Changing the battery/ rechargeable battery

(Rechargeable battery type: NiMH IEC 6F22)

! To avoid the loss of data, it is imperative that you **switch the instrument off** when changing the battery/rechargeable battery and replace the battery in < 10 min.

1 Open the battery compartment on the rear of the instrument.

2 Remove the empty monobloc battery/rechargeable battery.

3 Insert the new monobloc battery/rechargeable battery. Observe +/-.

4 Close the battery compartment.

Instrument will start automatically.

8.2 Charging the battery

Vorsicht!

Charge batteries properly!

Danger of explosion!

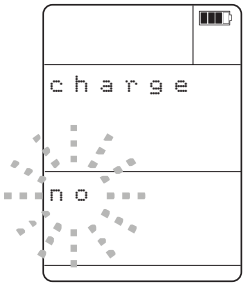
▶ Only start the charging process if a rechargeable battery is in the instrument and Rech. has been set as the battery type.

! The battery in the instrument can only be recharged if it is a rechargeable battery and Rech. is set as the battery type.

1 Make sure a rechargeable battery is in the instrument.

2 Make sure that Rech. is set as the battery type (see 6.6.3 Bat. type).

3 Connect the connector of the mains unit to the 12 V jack of the instrument.



4 Connect the mains plug to the mains socket.

5 Question as to whether rechargeable battery should be charged. Select **Yes** with ▼ and confirm with OK.
The charging process will start automatically.
▭ flashes during the charging process and the actual battery voltage is displayed.

- Automatically go to measurement menu.

8.3 Cleaning the instrument

▶ If the housing of the instrument is dirty, clean it with a damp cloth. Do not use any corrosive cleaning agents or solvents! Weak household cleaning agents and detergents may be used.

9. Troubleshooting

Fault	Possible causes	Remedy
Instrument switches off after printing	Battery voltage too low	Replace battery
Display cannot be zeroed.	The differential pressure is outside the zeroable range.	Make the differential pressure < 2.5% of full-scale value and zero the probes again.
Saved settings and readings are no longer held in the instrument.	Factory reset was carried out or battery was removed.	No remedy possible! Keep readings regularly in the software or on paper.
Velocity value is calculated incorrectly	Density input incorrect	Enter correct density
Velocity value is calculated incorrectly	Pitot tube factor incorrect	Enter correct Pitot tube factor.
Velocity value is calculated incorrectly	Pressure probe not zeroed before measurement	Zero pressure probe (without applying pressure)
Volume flow is calculated incorrectly	Offset factor or cross-section input incorrect	Enter correct offset or cross-section

If we were unable to answer your question, please contact your distributor or Testo Customer Service. You will find contact details in the Warranty booklet or in Internet at *www.testo.com*.

10. Technical data

10.1 Measuring ranges and accuracies

Instruments	testo 521-1, integrated differential pressure sensor 0560 5210	testo 521-2 integrated differential pressure sensor 0560 5211	testo 521-3, integrated differential pressure sensor 0560 5213	testo 526-1 integrated differential pressure sensor 0560 5280	testo 526-2 integrated differential pressure sensor 0560 5281
Sensor					
Measuring range	0 - 100 hPa	0 - 100 hPa	0...250Pa	0 - 2000 hPa	0 - 2000 hPa
Overload limit	300 hPa	300 hPa	50hPa	3000 hPa	3000 hPa
Static pressure	2000 hPa	2000 hPa	100hPa	2000 hPa	2000 hPa
Accuracy ±1 digit at at nom. temp. 22 °C and meas. cycle>1 s	±0.2 % of full-scale value	±0.1 % of full-scale value	±0,5 Pa (0...20Pa) ±(0,5Pa + 0,5% of reading) (20...250Pa)	±0.1 % of full-scale value	±0.05% of full scale value
Resolution	0.01 hPa (0 to 100 hPa)	0.01 hPa (0 to 100 hPa)	0.1 Pa	0.1 hPa (0 to 2000 hPa)	0.1 hPa (0 to 2000 hPa)

	Pressure probes	Pressure probes	NTC	Type K (NiCr-Ni)
Measuring range	to 2000 hPa	to 400bar	-40 - +150 °C	-200 - +1370 °C
Accuracy** ±1 digit	±0.1% of reading for Probe 0638 1347 Probe 0638 1447 Probe 0638 1547 Probe 0638 1647 Probe 0638 1747 Probe 0638 1847	±0.2% of reading for Probe 0638 1741 Probe 0638 1841 Probe 0638 1941 Probe 0638 2041 Probe 0638 2141	±0.2 °C (-10 - +50 °C) ±0.4 °C (-40 - 10.1 °C) ±0.4 °C (+50.1 - +150 °C)	±0.4 °C (-100 - +200 °C) ±1 °C (-200 - 100.1 °C) ±1 °C (+200.1 - +1370 °C)
Resolution	0.1 Pa (0638 1347) 0.001 hPa (0638 1447) 0.01 hPa (0638 1547) 0.1 hPa (0638 1647) 0.1 hPa (0638 1747) 0.1 hPa (0638 1847)	0.01 bar (0638 1741) 0.01 bar (0638 1841) 0.01 bar (0638 1941) 0.01 bar (0638 2041) 0.01 bar (0638 2141)	0.1 °C (-40 - +150 °C)	0.1 °C (-200 - +1370 °C)

Probe	Current measurement	Current/voltage measurement	Current/voltage measurement
Measuring range	0...20 mA	0 - 20 mA	0 - 10 V
Accuracy** ±1 digit	Probe 0554 0528 -	0554 0007* ±0.04 mA (0 - 20 mA)	0554 0007* ±0.01 V (0 - 10 V)
Resolution	0.01 mA (0...20 mA)	0.01 mA (0 - 20 mA)	0.01 V (0 - 10 V)

* Power supply cable
** Instrument accuracy data apply only to instrument (without connected probe)

10.2 Other instrument data

Power supply	9 V monobloc (6LR61), alkaline manganese or mains unit 12 V DC
Probe interface	Round 8-pin plug
PC interface	ComSoft V3.4; connecting lead 0409 0178
PC	RS232 interface
Printer interface	Infrared
Measuring data memory	approx. 25000 readings
Battery life in continuous use with internal pressure sensor	30h with alkaline manganese, 10 hrs. with rechargeable battery, 18 hrs. with zinc carbon at 25 °C and without lighting
Battery life with connected 4 to 20 mA interface	Dependent on transmitter connected Recommendation: Use mains unit
Sensor	Piezoresistive
Storage/transport temperature	-20 - +70 °C
Operating temperature (temperature-compensated)	0 - +50 °C
Intrinsic leakage	0.3 % pressure drop from test pressure over a period of 1 minute
Display	LCD display with symbol, 7-segment display and dot matrix part
Weight inc. TopSafe and battery	approx. 600 g
Housing material	ABS
Dimensions	(L x W x H) 219 x 68 x 50
Measuring rate	Auto 1s to 24h, fast 0.04s
Refresh rate of display	2 x per sec., with fast measurement 4 x per sec.
Other	Automatic detection of all connected probes
Warranty	24 Months

11. Accessories/spare parts

Article	Order no.
Instruments	
Differential pressure meter **testo 521-1,** accuracy ±0.2 % of full scale value	0560 5210
Differential pressure meter **testo 521-2,** accuracy ±0.1 % of full scale value	0560 5211
Differential pressure meter **testo 521-3,** accuracy ±0.5Pa (0 to 20Pa); ±(0.5Pa + 0.5% of reading) (20...250Pa)	0560 5213
Differential pressure meter **testo 526-1,** accuracy ±0.1 % of full scale value	0560 5280
Differential pressure meter **testo 526-2,** accuracy ±0.05 % of full scale value	0560 5281
Differential and absolute pressure probes	
Differential pressure probe 100 Pa	0638 1347
Differential pressure probe 10 hPa	0638 1447
Differential pressure probe 100 hPa	0638 1547
Differential pressure probe 1000 hPa	0638 1647
Differential pressure probe 2000 hPa	0638 1747
Absolute pressure probe 2000 hPa abs	0638 1847
Relative pressure probes	
Pressure probe 10 bar	0638 1741
Pressure probe 30 bar	0638 1841
Pressure probe 40 bar	0638 1941
Pressure probe 100 bar	0638 2041
Pressure probe 400 bar	0638 2141
Current/Voltage probes	
Scalable probe for 4 - 20 mA	0554 0528
Power supply cable (±1 V; ±10 V, 20 mA)	0554 0007
Replacement terminal	0205 0026
Temperature probes	
Globe thermometer for measuring radiant heat	0554 0670
IR surface probe for fast non-contact temperature measurement	0600 0750
Quick-action surface probe with sprung thermocouple strip, measurement range short-term to +500 °C	0604 0194
Quick-action surface probe with sprung thermocouple strip, measurement range short-term to +500 °C	0614 0194
Super quick-action surface probe, bent (probe tip at 90° angle), with sprung thermocouple strip	0604 0994
Super quick-action surface probe, bent (probe tip at 90° angle), with sprung thermocouple strip	0614 0994
Robust surface probe	0604 9993
Robust surface probe	0614 9993
Robust surface probe, bent (probe tip at 90° angle), suitable for confined spaces	0604 9893
Robust surface probe (probe tip at 90° angle), suitable for confined spaces	0614 9893
Robust surface probe with sprung thermocouple strip for high temperature range up to +700 °C	0600 0394
Pipe wrap probe for pipes with diameter of up to 2", for flow/return temperature measurement in hydronic systems	0600 4593
Magnetic probe, adhesive power approx. 20 N, with magnets, for measurements on metal surfaces	0600 4793
Magnetic probe, adhesive power approx. 10 N, with magnets, for higher temperatures, for measurements on metal surfaces	0600 4893
Miniature surface probe for measurements on electronic components, small motors	0600 1494
Roller surface probe	0600 5093
Fast response immersion/penetration probe	0604 0293
Fast response immersion/penetration probe	0614 0293
Super quick-action immersion/penetration probe for measurements in liquids	0604 0493
Super quick-action immersion/penetration probe for measurements in liquids	0614 0493
Super quick-action immersion/penetration probe for high temperatures	0604 0593
Super quick-action immersion/penetration probe for high temperatures	0614 0593

Article	Order no.
Temperature probes	
Super quick-action immersion/penetration probe for measurements in gases and liquids with a thin, low-mass tip	0604 9794
Super quick-action immersion/penetration probe for measurements in gases and liquids with a thin, low-mass tip	0614 9794
Robust immersion/penetration probe made of V4A stainless steel, waterproof and oven-proof, e.g. for the food sector	0600 2593
Smelting probe for measurements in non-ferrous melting baths, with exchangeable measuring tips	0600 5993
Adapter to connect NiCr-Ni thermocouples and probes with open wire ends	0600 1693
Highly accurate air probe for air and gas temperature measurements with bare, mechanically protected probe	0610 9714
Pitot tubes	
Pitot tube, 300 mm long, stainless steel, measures flow velocity	0635 2245
Pitot tube, 350 mm long, stainless steel, measures flow velocity	0635 2145
Pitot tube, 500 mm long, stainless steel, measures flow velocity	0635 2045
Pitot tube, 1000 mm long, stainless steel, measures flow velocity	0635 2345
Pitot tube, stainless steel, 360 mm long, measures flow velocity incl. temperature	0635 2040
Pitot tube, stainless steel, 500 mm long, measures flow velocity incl. temperature	0635 2140
Pitot tube, stainless steel, 1000 mm long, measures flow velocity incl. temperature	0635 2240
Accessories	
Plug-in mains unit 230 V	0554 0088
Mains unit 120 V	0554 0077
9 V rechargeable battery for measuring instrument	0515 0025
Lead, 1.5 m long, connects probe with plug-in head to measuring instrument	0409 1745
Lead, 1.5 m long, connects probe with plug-in head to measuring instrument	0430 0143
Lead, 5 m long, connects probe with plug-in head to measuring instrument, PUR coating material	0430 0145
Lead, 2.5m long, for pressure probes 0638 1741, 0638 1841, 0638 1941, 0638 2041, 0638 2141	0409 0202
RS232 cable, connecting lead from PC to instrument (1.8 m) for data transfer	0409 0178
testo printer with 1 roll of thermal paper and 4 mignon batteries	0554 0545
Charger for printer (with 4 standard rechargeable batteries)	0554 0110
Spare thermal paper for printer (6 rolls)	0554 0569
Spare thermal paper for printer (6 rolls), measuring data documentation can be read for up to 10 years	0554 0568
TopSafe with magnet holder and carry belt	0516 0446
Magnetic holder for TopSafe	0554 0225
Connecting hose, silicone, 5 m long	0554 0440
Connecting hose set, 2 x 1 m, coiled, inc. 1/8" screw fitting	0554 0441
Quick release connection	0440 0525
System case (plastic) for instrument and accessories, enables safe and reliable storage	0516 0526
Transport case (plastic) for instrument and accessories, enables safe and reliable storage	0516 0527
Software	
ComSoft 3 Professional with measuring data management incl. database, evaluation and graphics function, data analysis, trend curve	0554 0830

Article	Order no.
Temperature calibration certificates	
ISO temperature calibration certificate, for air/immersion probes, calibration points -18 °C, 0 °C, 60 °C	0520 0001
ISO temperature calibration certificate, instruments with air/immersion probes, calibration points 0 °C, 150 °C, 300 °C	0520 0021
ISO temperature calibration certificate, instruments with surface probes, calibration points 60 °C, 120 °C, 180 °C	0520 0071
DKD temperature calibration certificate, for air/immersion probes, calibration points -20 °C, 0 °C, 60 °C	0520 0211
DKD temperature calibration certificate, for air/immersion probes, calibration points 0 °C, 100 °C, 200 °C	0520 0221
DKD temperature calibration certificate, surface temperature probe, contact, calibration points 100 °C, 200 °C, 300 °C	0520 0271
Pressure calibration certificates	
ISO pressure calibration certificate, absolute pressure, 5 measuring points across the range (for 0638 1847)	0520 0125
ISO pressure calibration certificate, absolute pressure, 5 measuring points across the range 5/10/15/20/25Pa (for 0560 5213, 0638 1347)	0520 0405
ISO pressure calibration certificate, differential and relative pressure, 5 measuring points across the range (for 0638 1347, 0638 1741, 0638 1841, 0638 1941, 0638 2041, 0638 2141, 0560 5213)	0520 0005
ISO pressure calibration certificate, differential and relative pressure, 5 measuring points across the range (for 0560 5210, 0560 5211, 0560 5280, 0560 5281, 0638 1447, 0638 1547, 0638 1647, 0638 1747)	0520 0025
ISO pressure calibration certificate, differential and relative pressure, 5 measuring points across the range for 0560 5281	0520 0035
DKD pressure calibration certificate, diff. and relative pressure, 11 meas. points across the range (<0.1% of fsv.) for 0560 5281	0520 0205
DKD pressure calibration certificate, differential and relative pressure, 6 measuring points across the range (> 0.6 % of full scale value) (for 0638 1347, 0638 1741, 0638 1841, 0638 1941, 0638 2041, 0638 2141)	0520 0225
DKD pressure calibration certificate, absolute pressure, 11 measuring points across the range (0.1 - 0.6 % of full scale value) (for 0638 1847)	0520 0212
DKD pressure calibration certificate, differential and relative pressure, 11 measuring points across the range (0.1 - 0.6 % of full scale value) (for 0560 5210, 0560 5211, 0560 5280, 0560 5281,0638 1447, 0638 1547, 0638 1647, 0638 1747)	0520 0215
Scalable probe calibration certificates	
ISO scalable probe calibration certificate	0520 1000

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